



National Center for Science and
Engineering Statistics

Survey

Survey of State Government Research and Development | 2021

The Survey of State Government Research and Development provides comprehensive, uniform statistics regarding the extent of R&D activity performed and funded by departments and agencies in each of the nation's 50 states, the District of Columbia, and Puerto Rico.

Survey Description

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Survey Overview (FY 2021 survey cycle)

Purpose

The Survey of State Government Research and Development (R&D) is the only source for comprehensive, uniform statistics regarding the extent of R&D activity performed and funded by departments and agencies in each of the nation's 50 state governments, the government of the District of Columbia, and the government of Puerto Rico.

Data collection authority

The information is solicited under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. It is collected under Office of Management and Budget control number 0607–0933, expiration date 31 July 2023. The survey is conducted by the Census Bureau under Title 13, United States Code, § 8(b) for the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation.

Major changes to recent survey cycle

None.

Key Survey Information

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|----------------------------|--|
| Frequency | Annual. |
| Initial survey year | FY 2006. |
| Reference period | State government fiscal years ending in 2021. |
| Response unit | State government departments, agencies, commissions, public authorities, institutions, and other entities that operate separately or somewhat autonomously from the central state government—but where the state government maintains administrative or fiscal control over their activities—with the capacity to perform or fund R&D; units are collectively referred to as <i>agencies</i> . |
| Sample or census | Census. |
| Population size | 498 agencies. |
| Sample size | Not applicable. |
| Key variables | <ul style="list-style-type: none"> • State government department or agency • Total expenditures for R&D • R&D expenditures by source of funds (federal, state, and other) • Expenditures for intramural performance by source of funds • Expenditures for intramural performance by type of work (basic research, applied research, and experimental development) |

- Expenditures for extramural performance by source of funds
- Expenditures for extramural performance by type of performer (academic institutions, companies and individuals, and others)
- Federal funds for R&D by state and federal agency
- R&D expenditures by governmental function (agriculture, energy, environment and natural resources, health, transportation, and other)
- Capital outlays for state government R&D-related facilities
- R&D personnel and full-time equivalent by type (researchers, technicians, and support staff)

Survey Design

Target population

The target population consists of all state departments, agencies, commissions, and dependent entities that funded R&D activities for state government fiscal years ending in 2021. Several industry-specific state commissions, which are generally chartered by state legislatures but are administered independently, are considered state agencies and included in the survey's population of interest. Excluded are state-run colleges and universities, which are canvassed as part of NCSES's Higher Education Research and Development (HERD) Survey. State-run laboratories or experiment stations controlled by state universities are also excluded from the respondent universe, as are any entities determined to be nonprofit or private as defined by the Census Bureau. Most state fiscal year periods begin 1 July and end the following 30 June. For example, FY 2021 is defined as the state fiscal period beginning on 1 July 2020 and ending on 30 June 2021. There are, however, five exceptions to the 30 June fiscal year end: New York (ends 31 March), Texas (ends 31 August), and Alabama, the District of Columbia, and Michigan (end 30 September). For comparability, all states, the District of Columbia, and Puerto Rico are surveyed at the same time.

Sampling frame

The total universe includes all state government-dependent units with the capacity to perform or fund R&D, including those for the District of Columbia and Puerto Rico, as defined by the Census Bureau's [Government Finance and Employment Classification Manual](#). All units were identified with the aid of a state coordinator who was appointed by the governor of each state, Puerto Rico, and the mayor of the District of Columbia. For FY 2021, e-mails were sent to the chief of staff for each Governor's office asking them to appoint a state coordinator.

Sample design

The Survey of State Government R&D is a census. For the FY 2021 survey, state coordinators were provided with the list of agencies that were previously identified as having the potential to perform or fund R&D from the FY 2020 survey cycle. In addition, the list included agencies identified from a systematic review of state session laws and additional review of agencies reporting to the Census Bureau's [Census of Governments](#) program by staff members from the Census Bureau and NCSES. State coordinators were asked to review this list and add agencies that they believed were involved with R&D and were not already identified. State agencies that have reported \$0 R&D for the last three survey cycles were marked as inactive for this survey cycle. These will be reactivated for the FY 2023 survey cycle. State coordinators also adjusted the agency universe to remove agencies that have never had any qualifying R&D to report to NCSES, to add any agencies they thought were missing or could possibly have R&D to report, to address organizational changes within their respective states since the previous survey, and to provide updated agency contact information.

Data Collection and Processing

Data collection

The survey was funded by NCSES. Data collection was conducted by the Census Bureau via an e-mail containing a survey form. The survey was launched in September 2021, and responses were collected through mid-June 2022. The respondent questionnaire consisted of one screening question intended to reduce the burden on agency respondents who did not have qualifying R&D expenditures during FY 2021, seven questions regarding R&D-related expenditures, and two questions regarding counts of employees.

Data processing

Data collected under the survey are subject to automated data correction procedures using a combination of logical edits incorporated into the survey form, as well as telephone and e-mail follow-up with survey respondents by staff members from NCSES and the Census Bureau for any other data anomalies.

Estimation techniques

All state and national totals are summations of reported state agency data.

Survey Quality Measures

Sampling error

Not applicable.

Coverage error

In addition to a Census Bureau review of state session laws to identify agencies with the capacity to fund R&D, NCSES utilizes the expertise of an appointed state coordinator to assist in identifying state government agencies that have the capacity to perform or fund R&D. State coordinators are also offered the opportunity to review survey responses from their respective state agencies before results are finalized for data release. In cases where the state coordinator refused to cooperate or where some agencies did not respond to the survey, it is possible there may be an undercount of state government R&D activities. The undercount may occur despite efforts by staff members of NCSES and the Census Bureau to conduct additional queries and conduct outreach with state agencies that did not appoint a state coordinator. In other instances, the appointed state coordinator could misinterpret the NCSES definition and examples of qualifying R&D activities and not identify all state government-dependent units with the capacity to perform or fund R&D.

Nonresponse error

Of the 498 agencies in the survey universe, 476 (95.6%) responded to the survey. Of the 476 respondents, 399 (83.8%) reported having R&D activities in FY 2021. A mathematical imputation method was used to impute three nonresponding agencies known to have R&D in the past, namely the Kentucky Department of Fish and Wildlife Resources, New Mexico Department of Game and Fish, and Tennessee Department of Education. The agency in Tennessee was imputed despite having responded due to some reporting discrepancies. Puerto Rico did not participate in this year's survey. No statistical methods were used to account for the other nonresponding agencies, which historically have reported not having R&D.

Measurement error

All responses, including the initial agency data submissions and final state coordinator reviews, were received via e-mail or phone. Census Bureau staff performed basic logical edit checks and reviewed respondent comments, allowing staff to detect errors and work with respondents to correct them. Despite these efforts, some of the data reported could include expenditures for non-R&D activities, such as commercialization, environmental testing, or routine survey work. Similarly, some state data may also exclude minor R&D expenditure amounts from agencies not surveyed.

Data Availability and Comparability

Data availability

Data presented in trend tables in this report are from the most recently completed survey cycle. Agency-level data are available beginning with FY 2009. No survey of state governments' FY 2008 R&D activity was conducted.

Data comparability

References to data prior to FY 2021 should be restricted to those published in this report for three reasons: (1) when completing the current-year survey, survey respondents may revise their prior-year data; (2) state coordinators may identify additional agencies to be canvassed that were not initially surveyed during the prior survey cycle, and many of these agencies will provide prior-year data during the current survey collection cycle; and (3) NCSES reviews data from prior years for consistency with current-year responses and, if necessary, may revise these data in consultation with respondents.

For FYs 1995, 1988, and 1987, data collections of state government R&D were conducted by nonfederal organizations that were supported by NCSES grants. Prior to those efforts, NCSES collected state government R&D data for FYs 1977, 1973, 1972, 1968, 1967, 1965, and 1964 in collaboration with the Census Bureau's [Census of Governments](#) and related programs. Because of differences in the survey populations, in definitions of covered R&D activities, and in collection methods over time, the results of these historical surveys are not comparable with the statistics collected for FY 2006 and subsequent Surveys of State Government R&D.

Data Products

Data from the Survey of State Government R&D are published in NCSES InfoBriefs and data tables available at <https://www.nsf.gov/statistics/srvystaterd/>. Data from the Survey of State Government R&D are also used in the annual report *National Patterns of R&D* and the biennial report *Science and Engineering Indicators*.